[DISCUSSION DRAFT]

MARCH 20, 2008

110TH CONGRESS
2D SESSION

H. R. _____

To authorize activities for support of nanotechnology research and development, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M__. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

To authorize activities for support of nanotechnology research and development, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''National Nanotechnology Initiative Amendments Act of 2008''.

SEC. 2. NATIONAL NANOTECHNOLOGY PROGRAM AMENDMENTS.

The 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501 et seq.) is amended—

(1) by striking section 2(c)(4) and inserting the following new paragraph:

''(4) develop, within 12 months after the date of enactment of the National Nanotechnology Initiative Amendments Act of 2008, and update every 3 years thereafter, a strategic plan to guide the activities described under subsection (b) that specifies near-term and long-term objectives for the Program, the anticipated time frame for achieving the near-term objectives, and the metrics to be used for assessing progress toward the goals, and that describes—

''(A) how the Program will move results out of the laboratory and into applications for the benefit of society, including through cooperation and collaborations with nanotechnology research, development, and technology transition initiatives supported by the States;

''(B) how the Program will encourage and support interdisciplinary research and development in nanotechnology; and

''(C) proposed multiagency-funded research and development projects focused on specific applications of nanotechnology having the potential for significant economic and societal impacts;'';

(2) in section 2, by inserting at the end the following new subsection:

''(e) TRAVEL COSTS.—The agencies participating in the Program may reimburse the travel costs of scientists and engineers who participate in activities of committees involved in the development of standards for nanotechnology.'';

(3) by striking section 3(b) and inserting the following new subsection:

''(b) FUNDING.—(1) The operation of the National Nanotechnology Coordination Office shall be supported by funds from each agency participating in the Program. The portion of such Office's total budget provided by each agency for each fiscal year shall be in the same proportion as the agency's share of the total budget for the Program for that fiscal year, as specified in the report required under section 2(d)(1).

''(2) The annual report under section 2(d) shall include—

''(A) a description of the funding required by the National Nanotechnology Coordination Office to perform the functions specified under subsection (a) for the next fiscal year by category of activity, including the funding required to carry out the requirements of section 2(b)(10)(D) and subsection (d) of this section;

''(B) a description of the funding required by such Office to perform the functions specified under subsection (a) for the current fiscal year by category of activity, including the funding required to carry out the requirements of subsection (d); and

''(C) the amount of funding provided for such Office for the current fiscal year by each agency participating in the Program.'';

(4) by inserting at the end of section 3 the following new subsection:

''(d) PUBLIC INFORMATION.—(1) The National Nanotechnology Coordination Office shall develop and maintain a database accessible by the public of projects funded under the Environmental, Health, and Safety, the Education and Societal Dimensions, and the Nanomanufacturing program component areas, or any successor program component areas, including a description of each activity, its source of funding by agency, and

its funding history. For the Education and Societal Dimensions program component area, or any successor program component area, the projects shall be grouped in subcategories of—

''(A) education in formal settings;

''(B) education in informal settings;

''(C) public outreach; and

''(D) ethical, legal, and other societal issues.

''(2) The National Nanotechnology Coordination Office shall develop, maintain, and publicize information on nanotechnology facilities supported under the Program that are accessible for use by individuals from academic institutions and from industry. The information shall include at a minimum the terms and conditions for the use of each facility, a description of the capabilities of the instruments and equipment available for use at the facility, and a description of the technical support available to assist users of the facility.'';

(5) in section 4(a)—

(A) by striking ''or designate'';

(B) by inserting ''as a distinct entity'' after ''Advisory Panel''; and

(C) by inserting at the end ''The Advisory Panel shall form a subpanel with membership having specific qualifications tailored to enable

it to carry out the requirements of subsection (c)(7).'';

(6) in section 4(b), by striking ''or designated'' and ''or designating'';

(7) by amending section 5 to read as follows:

''SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL NANOTECHNOLOGY PROGRAM.

''(a) IN GENERAL.—The Director of the National Nanotechnology Coordination Office shall enter into an arrangement with the National Research Council of the National Academy of Sciences to conduct a triennial review of the Program. The Director shall ensure that the arrangement with the National Research Council is concluded in order to allow sufficient time for the reporting requirements of subsection (b) to be satisfied. Each triennial review shall include an evaluation of the—

''(1) research priorities and technical content of the Program, including whether the allocation of funding among program component areas, as designated according to section 2(c)(2), is appropriate;

''(2) effectiveness of the Program's management and coordination across agencies and disciplines, including an assessment of the effectiveness of the National Nanotechnology Coordination Office;

''(3) Program's scientific and technological accomplishments and its success in transferring technology to the private sector; and

''(4) adequacy of the Program's activities addressing ethical, legal, environmental, and other appropriate societal concerns, including human health concerns.

''(b) EVALUATION TO BE TRANSMITTED TO CONGRESS.—The National Research Council shall document the results of each triennial review carried out in accordance with subsection (a) in a report that includes any recommendations for ways to improve the Program's management and coordination processes and for changes to the Program's goals, funding priorities, and technical content. Each report shall be submitted to the Director of the National Nanotechnology Coordination Office, who shall transmit it to the Advisory Panel, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives not later than September 30 of every third year, with the first report due September 30, 2009.

''(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Office of Science and Technology Policy to carry out this section—

''(1) $500,000 for fiscal year 2009;

''(2) $500,000 for fiscal year 2010; and

''(3) $500,000 for fiscal year 2011.''; and

(8) in section 10—

(A) by amending paragraph (2) to read as follows:

''(2) NANOTECHNOLOGY.—The term 'nanotechnology' means the science and technology that will enable one to understand, measure, manipulate, and manufacture at the nanoscale, aimed at creating materials, devices, and systems with fundamentally new properties or functions.''; and

(B) by adding at the end the following new paragraph:

''(7) NANOSCALE.—The term 'nanoscale' means one or more dimensions of between approximately 1 and 100 nanometers.''.

SEC. 3. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.

(a) COORDINATOR FOR SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.—The Director of the Office of Science and Technology Policy shall designate an associate director of the Office of Science and Technology Policy as the Coordinator for Societal Dimensions of Nanotechnology. The Coordinator shall be responsible for oversight of the coordination, planning, and budget

prioritization of activities required by section 2(b)(10) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(10)). The Coordinator shall, with the assistance of appropriate senior officials of the agencies funding activities within the Environmental, Health, and Safety and the Education and Societal Dimensions program component areas of the Program, or any successor program component areas, ensure that the requirements of such section 2(b)(10) are satisfied. The responsibilities of the Coordinator shall include—

(1) ensuring that a research plan for the environmental, health, and safety research activities required under subsection (b) is developed, updated, and implemented and that the plan is responsive to the recommendations of the subpanel of the Advisory Panel established under section 4(a) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7503(a)), as amended by this Act;

(2) encouraging and monitoring the efforts of the agencies participating in the Program to allocate the level of resources and management attention necessary to ensure that the ethical, legal, environmental, and other appropriate societal concerns related to nanotechnology, including human health concerns, are addressed under the Program, includ-

ing the implementation of the research plan described in subsection (b); and

(3) encouraging the agencies required to develop the research plan under subsection (b) to identify, assess, and implement suitable mechanisms for the establishment of public-private partnerships for support of environmental, health, and safety research.

(b) RESEARCH PLAN.—

(1) IN GENERAL.—The Coordinator for Societal Dimensions of Nanotechnology shall convene and chair a panel comprised of representatives from the agencies funding research activities under the Environmental, Health, and Safety program component area of the Program, or any successor program component area, and from such other agencies as the Coordinator considers necessary to develop, periodically update, and coordinate the implementation of a research plan for this program component area. In developing and updating the plan, the panel convened by the Coordinator shall solicit and be responsive to recommendations and advice from—

(A) the subpanel of the Advisory Panel established under section 4(a) of the 21st Century Nanotechnology Research and Develop-

ment Act (15 U.S.C. 7503(a)), as amended by this Act; and

(B) the agencies responsible for environmental, health, and safety regulations associated with the production, use, and disposal of nanoscale materials and products.

(2) DEVELOPMENT OF STANDARDS.—The plan required under paragraph (1) shall include a description of how the Program will help to ensure the development of—

(A) standards related to nomenclature associated with engineered nanoscale materials;

(B) engineered nanoscale standard reference materials for environmental, health, and safety testing; and

(C) standards related to methods and procedures for detecting, sampling, and testing engineered nanoscale materials for environmental, health, and safety impacts.

(3) COMPONENTS OF PLAN.—The plan required under paragraph (1) shall, with respect to activities described in paragraphs (1) and (2)—

(A) specify near-term research goals and long-term research objectives;

(B) specify milestones associated with each near-term goal and the estimated time and resources required to reach each milestone;

(C) describe the role of each agency carrying out or sponsoring research in accordance with the plan;

(D) specify the funding allocated to each major goal and objective of the plan and the source of funding by agency for the current fiscal year; and

(E) estimate the funding required for each major goal and objective of the plan and the source of funding by agency for the following 3 fiscal years.

(4) TRANSMITTAL TO CONGRESS.—The plan required under paragraph (1) shall be submitted not later than 60 days after the date of enactment of this Act to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives.

(5) UPDATING AND APPENDING TO REPORT.—The plan required under paragraph (1) shall be updated annually and appended to the report required under section 2(d) of the 21st Century

Nanotechnology Research and Development Act (15 U.S.C. 7501(d)).

(c) FUNDING GUIDELINES.—Not less than 10 percent of the aggregate amount of funds appropriated for the activities carried out under the Program during any fiscal year shall be used for the activities constituting the Environmental, Health, and Safety program component area, or any successor program component area.

(d) NANOTECHNOLOGY PARTNERSHIPS.—

(1) ESTABLISHMENT.—As part of the program authorized by section 9 of the National Science Foundation Authorization Act of 2002, the Director of the National Science Foundation shall provide 1 or more grants to establish partnerships as defined by subsection (a)(2) of that section, except that each such partnership shall include 1 or more businesses engaged in the production of nanoscale materials, products, or devices. Partnerships established in accordance with this subsection shall be designated as ''Nanotechnology Education Partnerships''.

(2) PURPOSE.—Nanotechnology Education Partnerships shall be designed to recruit and help prepare secondary school students to pursue postsecondary level courses of instruction in

nanotechnology. At a minimum, grants shall be used to support—

(A) professional development activities to enable secondary school teachers to use curricular materials incorporating nanotechnology and to inform teachers about career possibilities for students in nanotechnology;

(B) enrichment programs for students, including access to nanotechnology facilities and equipment at partner institutions, to increase their understanding of nanoscale science and technology and to inform them about career possibilities in nanotechnology as scientists, engineers, and technicians; and

(C) identification of appropriate nanotechnology educational materials and incorporation of nanotechnology into the curriculum of schools participating in a Partnership.

(3) SELECTION.—Grants under this subsection shall be awarded in accordance with subsection (b) of such section 9, except that paragraph (3)(B) of that subsection shall not apply.

(e) UNDERGRADUATE EDUCATION PROGRAMS.—

(1) ACTIVITIES SUPPORTED.—As part of the activities included under the Education and Societal

Dimensions program component area, or any successor program component area, the Program shall support efforts to introduce nanoscale science, engineering, and technology into undergraduate science and engineering education through a variety of interdisciplinary approaches. Activities supported may include—

(A) development of courses of instruction or modules to existing courses;

(B) faculty professional development; and

(C) acquisition of equipment and instrumentation suitable for undergraduate education and research in nanotechnology.

(2) COURSE, CURRICULUM, AND LABORATORY IMPROVEMENT AUTHORIZATION.—There are authorized to be appropriated to the Director of the National Science Foundation to carry out activities described in paragraph (1) through the Course, Curriculum, and Laboratory Improvement program—

(A) from amounts authorized under section 7002(b)(2)(B) of the America COMPETES Act, $5,000,000 for fiscal year 2009; and

(B) from amounts authorized under section 7002(c)(2)(B) of the America COMPETES Act, $5,000,000 for fiscal year 2010.

(3) ADVANCED TECHNOLOGY EDUCATION AUTHORIZATION.—There are authorized to be appropriated to the Director of the National Science Foundation to carry out activities described in paragraph (1) through the Advanced Technology Education program—

(A) from amounts authorized under section 7002(b)(2)(B) of the America COMPETES Act, $5,000,000 for fiscal year 2009; and

(B) from amounts authorized under section 7002(c)(2)(B) of the America COMPETES Act, $5,000,000 for fiscal year 2010.

(f) INTERAGENCY WORKING GROUP.—The National Science and Technology Council shall establish under the Nanoscale Science, Engineering, and Technology Subcommittee an Education Working Group to coordinate, prioritize, and plan the educational activities supported under the Program.

SEC. 4. TECHNOLOGY TRANSFER.

(a) PROTOTYPING.—

(1) ACCESS TO FACILITIES.—In accordance with section 2(b)(7) of 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(7)), the agencies supporting nanotechnology research facilities as part of the Program shall pro-

vide access to such facilities to companies for the purpose of assisting the companies in the development of prototypes of nanoscale products, devices, or processes (or products, devices, or processes enabled by nanotechnology) for determining proof of concept. The agencies shall publicize the availability of these facilities and encourage their use by companies as provided for in this section.

(2) PROCEDURES.—Projects provided access to nanotechnology facilities in accordance with this subsection shall be chosen through a competitive, merit-based process and in accordance with the criteria of paragraph (3). The agencies identified in paragraph (1)—

(A) shall establish and publish procedures, guidelines, and conditions for the submission and approval of applications for use of nanotechnology facilities;

(B) shall publish descriptions of the capabilities of facilities available for use under this subsection, including the availability of technical support; and

(C) may require full or partial recovery of the costs associated with use of the facilities for projects under this subsection.

(3) CRITERIA.—The criteria for the selection of projects for use of facilities under this subsection shall include at a minimum—

(A) the readiness of the project for technology demonstration;

(B) evidence of a commitment by the applicant for further development of the project to full commercialization if the proof of concept is established by the prototype; and

(C) evidence of the potential for further funding from private sector sources following the successful demonstration of proof of concept.

The agencies may give special consideration in selecting projects to applications that are relevant to important Federal needs or requirements.

(b) USE OF EXISTING TECHNOLOGY TRANSFER PROGRAMS.—

(1) PARTICIPATING AGENCIES.—Each agency participating in the Program shall—

(A) encourage the submission of applications for support of nanotechnology related projects to the Small Business Innovation Research Program and the Small Business Tech-

nology Transfer Program administered by such agencies; and

(B) through the National Nanotechnology Coordination Office and within 6 months after the date of enactment of this Act, submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives—

(i) the plan described in section 2(c)(7) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(c)(7)); and

(ii) a report specifying, if the agency administers a Small Business Innovation Research Program and a Small Business Technology Transfer Program—

(I) the number of proposals received for nanotechnology related projects during the current fiscal year and the previous 2 fiscal years;

(II) the number of such proposals funded in each year;

(III) the total number of nanotechnology related projects fund-

ed and the amount of funding provided for fiscal year 2003 through fiscal year 2007; and

(IV) a description of the projects identified in accordance with subclause (III) which received private sector funding beyond the period of phase II support.

(2) NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.—The Director of the National Institute of Standards and Technology in carrying out the requirements of section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n) shall—

(A) in regard to subsection (d) of that section, encourage the submission of proposals for support of nanotechnology related projects; and

(B) in regard to subsection (g) of that section, include a description of how the requirement of subparagraph (A) of this paragraph is being met, the number of proposals for nanotechnology related projects received, the number of such proposals funded, the total number of such projects funded since the beginning of the Technology Innovation Program,

and the outcomes of such funded projects in terms of the metrics developed in accordance with such subsection (g).

(3) TIP ADVISORY BOARD.—The TIP Advisory Board established under section 28(k) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(k)), in carrying out its responsibilities under subsection (k)(3), shall provide the Director of the National Institute of Standards and Technology with—

(A) advice on how to accomplish the requirement of paragraph (2)(A) of this subsection; and

(B) an assessment of the adequacy of the allocation of resources for nanotechnology related projects supported under the Technology Innovation Program.

(c) INDUSTRY LIAISON GROUPS.—A goal of the Program shall be to establish industry liaison groups for all industry sectors that would benefit from applications of nanotechnology. The Nanomanufacturing, Industry Liaison, and Innovation Working Group of the National Science and Technology Council shall actively pursue establishing such liaison groups, including one focused on industries producing and employing composite materials.

(d) COORDINATION WITH STATE INITIATIVES.—Section 2(b)(5) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(5)) is amended to read as follows:

''(5) ensuring United States global leadership in the development and application of nanotechnology, including through coordination and leveraging Federal investments with nanotechnology research, development, and technology transition initiatives supported by the States;''.

SEC. 5. RESEARCH IN AREAS OF NATIONAL IMPORTANCE.

(a) IN GENERAL.—The Program shall include support for research and development activities associated with applications of nanotechnology that have the potential for significant economic and societal impacts. The projects supported shall be designed to accelerate the development of promising research discoveries toward near-term technical solutions to important problems in such areas as electronics, energy efficiency, health care, and water remediation and purification. The Advisory Panel shall make recommendations to the Program for candidate research and development areas for support under this section.

(b) CHARACTERISTICS.—

(1) IN GENERAL.—Projects supported under this section shall—

(A) be selected on the basis of applications for support through a competitive, merit-based process;

(B) involve collaborations among researchers in academic institutions, industry, nonprofit research institutions, and Federal laboratories; and

(C) include a plan for transferring technology developed under the project to industry for commercial development.

(2) PROCEDURES.—Determination of the requirements for applications under this subsection, review and selection of applications for support, and subsequent funding of projects shall be carried out by a collaboration of no fewer than 2 agencies participating in the Program. In selecting applications for support, the agencies shall give special consideration to projects that include cost sharing from non-Federal sources.

(3) INTERDISCIPLINARY RESEARCH CENTERS.—Projects supported under this section may include interdisciplinary research centers that are organized to investigate both near-term and long-term research

questions in areas such as those identified in subsection (a).

(c) REPORT.—Reports required under section 2(d) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(d)) shall include a description of projects carried out in accordance with this section.

SEC. 6. NANOMANUFACTURING RESEARCH.

(a) RESEARCH AREAS.—The Nanomanufacturing program component area, or any successor program component area, shall include research on—

(1) development of instrumentation and tools required for the rapid characterization of nanoscale materials and for monitoring of nanoscale manufacturing processes; and

(2) approaches and techniques for scaling the synthesis of new nanoscale materials to achieve industrial-level production rates.

(b) GREEN NANOTECHNOLOGY.—Interdiciplinary research centers supported under the Program in accordance with section 2(b)(4) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(4)) that are focused on nanomanufacturing research and centers established under the authority of section 5(b)(3) of this Act shall include as part of the activities of such centers—

(1) research on methods and approaches to develop environmentally benign nanoscale products and nanoscale manufacturing processes;

(2) fostering the transfer of the results of such research to industry; and

(3) providing for the education of scientists and engineers through interdisciplinary studies in the principles and techniques for the design and development of environmentally benign nanoscale products and processes.

(c) REVIEW OF NANOMANUFACTURING RESEARCH.—

(1) PUBLIC MEETING.—Not later than 6 months after the date of enactment of this Act, the National Nanotechnology Coordination Office shall sponsor a public meeting with representation from a wide range of industries engaged in nanoscale manufacturing to obtain the views of such industries on the relevance and value of the research being carried out under the Nanomanufacturing program component area of the Program, or any successor program component area, and to receive any recommendations on ways to strengthen the research portfolio supported under the Nanomanufacturing program component area, or any successor program component area. Companies participating in industry liai-

son groups shall be invited to participate in the meeting. The Coordination Office shall prepare a report documenting the findings and recommendations resulting from the meeting.

(2) ADVISORY PANEL REVIEW.—The Advisory Panel shall review the Nanomanufacturing program component area of the Program, or any successor program component area, to assess—

(A) whether the funding for the Nanomanufacturing program component area, or any successor program component area, is adequate and receiving appropriate priority within the overall resources available for the Program; and

(B) the relevance of the research being supported to the identified needs and requirements of industry.

In carrying out its assessment, the Advisory Panel shall take into consideration the findings and recommendations from the report required under paragraph (1).

(3) REPORT.—Not later than 15 months after the date of enactment of this Act, the Advisory Panel shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the

Committee on Science and Technology of the House of Representatives a report on its assessment required under paragraph (2), along with any recommendations and a copy of the report prepared in accordance with paragraph (1).

SEC. 7. DEFINITIONS.

In this Act, terms that are defined in section 10 of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7509) have the meaning given those terms in that section.